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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/669,347 | 09/25/2003 | Takahiko Nakano | 0951-0125P | 6595 |

2292 7590 06/09/2005

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EXAMINER

NGUYEN, SANG H

ART UNIT PAPER NUMBER

2877

DATE MAILED: 06/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,347

Applicant(s)

NAKANO, TAKAHIKO

Examiner

Sang Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/25/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 09/25/03 has been entered. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

Figures 5-6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Pre-Amendment

The applicant's response to Pre-Amendment filed on 09/25/03 has been entered. It is noted that the application contains claims 1-6 by the Pre-Amendment filed on 09/25/03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prior Art of Present Invention (Figures 5-6) in view of Miyoshi (U.S. Patent No. 4,897,536).

Regarding claim 1; PAPI discloses a triangulation-type optical displacement sensor (figures 5-6) having at least one light-emitting element(103 of figure 5 or 120 of figure 6) for projecting light onto at least one target (107 of figure 5 or 117 of figure 6) to which one or more distances being measured ($\Delta L1$, $\Delta L2$ of figure 5) , and at least one light-receiving element (110 of figure 5 or 122 of figure 6) for receiving at least a portion of the light reflected (figures 5-6) from at least one of the distance measurement targets (107 of figure 5 or 117 of figure 6) and being disposed such that at least one light-receiving surface thereof is substantially perpendicular to at least one optical axis of at least a portion of the projected light (figures 5-6). See figures 5-6.

PAPI discloses all of features of claimed invention except for at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets, and said at least one slit for narrowing at least a portion of the light reflected from aid at least one of the distance measurement targets. However, Miyoshi teaches that it is known in the art to provide optical axis displacement sensor comprising a laser source (30 of figure 4) and a CCD line sensor (50 of figure 4), and a light shielding plate, wherein the light shielding plate (44 of figure 4) having at least one slits (45, 46a, 46b of figure 4) and wherein the slit (45 f figure 4) for narrowing at least one light beam projected toward at least one of the distance measurement targets (S, S'

of figure 4), and said at least one slit (46a,46b of figure 4) for narrowing at least a portion of the light reflected from aid at least one of the distance measurement targets (S, S' of figure 4). See figures 1-12.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of PAPI with at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets, and said at least one slit for narrowing at least a portion of the light reflected from aid at least one of the distance measurement targets as taught by Miyoshi for the purpose of reducing or narrowing bandwidth wavelength for measuring high accurate the displacement of a target surface in wide range.

Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over PAPI in view of Miyoshi as applied to claim 1 above, and further in view of Reichard (U.S. Patent No. 3,740,563).

Regarding claim 4; PAPI in view of Miyoshi discloses all of features of the claimed invention except for the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets, and at least one filter being arranged at the incident side of at lest the one of the slits narrowing at least a portion of the light reflected from at least one of the distance measurement targets. However, Reichard teaches that it is known in the art to provide at least one filter (31 of figure 1A) being arranged at an exit side of at least one of slit (34 of figure 1A) for narrowing the at least

one of the light beams projected toward at least one of the distance measurement targets (96, 99 of figure 1), and at least one another filter (31 of figure 1A) being arranged at the incident side of at least the one of the slits narrowing at least a portion of the light reflected from at least one of the distance measurement targets to a photodetector (21 of figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Rudd et al with the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets, and at least one filter being arranged at the incident side of at lest the one of the slits narrowing at least a portion of the light reflected from at least one of the distance measurement targets as taught by Reichard for the purpose of filtering or reducing noise light system.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rudd et al (U.S. Patent No. 5,519,204) in view of Breyer (U.S. Patent No. 5,065,526).

Regarding claim 2; Rudd et al discloses a triangulation-type optical displacement sensor (12 of figure 2) having at least one light-emitting element (18 of figure 2) for projecting light onto at least one target (19 of figure 2) to which one or more distances being measured through a focus lens (20 of figure 2), and at least one light-receiving element (24 of figure 2) for receiving at least a portion of the light reflected(21 of figure 2) from at least one of the distance measurement targets (19 of figure 2) through a receiver lens (22 of figure 2) and being disposed such that at least one light-

receiving surface thereof is substantially perpendicular to at least one optical axis of at least a portion of the projected light (figure 2), wherein the receiver lens (22 of figure 2) considered to be at least one light collecting element collecting at least a portion of the light reflected (21 of figure 2) from at least one of the distance measurement targets (19 of figure 2). See figures 2-3.

Breyer discloses all of features of claimed invention except for at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets. However, Breyer teaches that it is known in the art to provide an optical triangulation sensor having a laser (28 of figure 3), a measured diode array (30 of figure 3), and at least one slit considered to be an apertures (23 of figure 3) for narrowing at least one light beam projected toward at least one of the distance measurement targets (10, M of figure 3 and col.4 lines 20-32).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Rudd et al with at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets as taught by Breyer for the purpose of reducing light transmitting with measuring high accurate the displacement of a target surface.

Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rudd et al in view of Breyer as applied to claim 2 above, and further in view of Ikari et al (U.S. Patent No. 4,864,147).

Regarding claim 3; Rudd et al in view of Breyer discloses all of features of claimed invention except for the at least one of light collecting element is a cylindrical lens. However, Ikari et al teaches that it is known in the art to provide the receiving lens system (13 of figures 1 and 10-11) considered to be the at least one of light collecting element is a cylindrical lens (col.10 lines 25-31 and claim 4). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Rudd et al with the at least one of light collecting element is a cylindrical lens as taught by Ikari et al for the purpose of focusing light beam to image sensor with high accuracy image.

Claim 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudd et al in view of Breyer, further in view of Ikari et al as applied to claims 2-3 above, and further in view of Reichard (U.S. Patent No. 3,740,563).

Regarding claims 5-6; Rudd et al in view of Breyer, further in view of Ikari et al discloses all of features of the claimed invention except for the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets. However, Reichard teaches that it is known in the art to provide at least one filter (31 of figure 1A) being arranged at an exit side of at least one of slit (34 of figure 1A) for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets (96, 99 of figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Rudd et al with the at least one filter being arranged at an exit

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side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets as taught by Reichard for the purpose of filtering or reducing noise light system.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kaupert (6741363) discloses method and apparatus for optical detection of line; Muller (6492652) discloses opto-electronic distance sensor; Schumacher (6122039) discloses method and apparatus for detecting and reporting object displacement; Koch (5218427) discloses ranging system for three dimensional object; or Leu et al (5113080) discloses non-linear displacement sensor based on optical triangulation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Nguyen whose telephone number is (571) 272-2425. The examiner can normally be reached on 9:30 am to 7:00 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sang Nguyen/SN

June 2, 2005


Gregory J. Tooley, Jr.
Supervisory Patent Examiner
7 June 05